

CLAIMS

1. A pulse power supply device for supplying a bipolar pulse current to an inductive load with high repetition and regenerating residual magnetic energy of a system so as to use it for next discharge, wherein

an energy source capacitor initially charged is connected to a DC terminal of a bridge circuit composed of four inverse-conductive semiconductor switches, and the inductive load is connected to its AC terminal,

a control circuit for giving a control signal to gates of the inverse-conductive semiconductor switches and controlling an on/off state of the semiconductor switches is further provided,

the control circuit controls pairs of the four inverse-conductive semiconductor switches composing the bridge circuit positioned on diagonal lines, respectively, so that the pairs are turned on simultaneously or alternately, and controls the pairs so that when at least one of the paired two inverse-conductive semiconductor switches is on, the other paired inverse-conductive semiconductor switches are off.

2. The pulse power supply device using regenerating magnetic energy according to claim 1, wherein a low-voltage large-current power supply is inserted in series with the inductive load so as to replenish lost energy due to discharge so as to increase or decrease next discharge current.

3. The pulse power supply device using regenerating magnetic energy according to claim 1 or 2, wherein the inverse-conductive semiconductor switches are any one kind of power MOSFETs, inverse-conductive GTO thyristors and units constituted so that diodes and semiconductor switches such as IGBT and the like are connected in parallel.

4. The pulse power supply device using regenerating magnetic energy according to any one of claims 1 to 3, wherein one of the two pairs of inverse-conductive semiconductor switches is replaced by diodes.